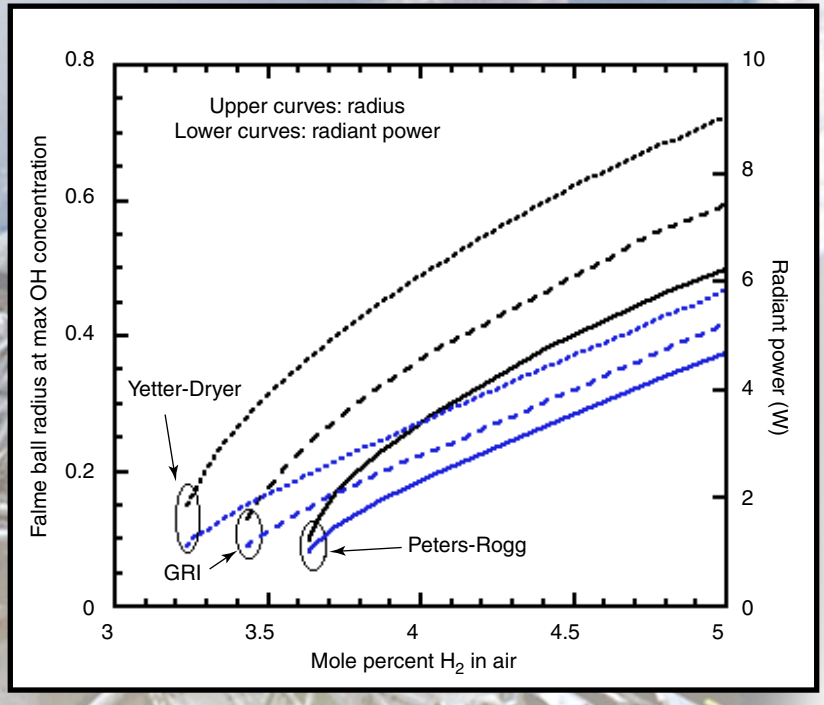
Glenn Research Center

Predicted Flame Ball Radii for H_2-Air Mixtures using Three Popular Chemical Models

- All curves use the same numerical code, with the same transport and radiation models.
- At 3.64% H_2, the ratio of the predicted flame ball sizes using the Yetter-Dryer chemistry to that for the Peters-Rogg chemistry is 3.7. The ratio of radiant power is 2.4.
- Farther from the limits, the agreement is much better - at 5% H_2, the ratios are 1.5 and 1.3, respectively.
- The radius at the extinction point is similar for all three models, in accord with theoretical predictions.



Even for "simple systems" like H_2-air, benchmark data from SOFBALL are needed to improve our chemical kinetic understanding.